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Evaluation Indicators of Aesthetic Effects on Hair Transplantation

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Abstract: Hair transplantation involves the transplantation of hair, beard, eyebrows, eyelashes, and pubic hair. Based on our experience, the aesthetic result of hair transplantation mainly relies on 4 indicators, including selection of the donor site, direction and angle of grafted hairs, density, and survival rate of implanted hair follicles. We believe that good results can be achieved as long as attention is paid to the above 4 points.

Key Words: hair loss, hair follicle, hair transplantation

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Since the beginning of recorded history, hair has been one of the cornerstones of the human concept of beauty and strength. Other than historical differences in style, a thick, full head of hair has always been associated with youth, vitality, strength, and pulchritude. Thus, hair loss can have significant psychosocial manifestations.^{1,2} Consequently, the baldness treatment industry is worth billions of dollars worldwide annually.³ Although there are now several approved pharmacologic options to prevent hair loss, hair transplantation (HTS) is still the most effective method to treat hair loss.⁴

To date, HTS has a history of nearly 210 years, which involves the transplantation of hair, beard, eyebrows, eyelashes, and pubic hair⁵; however, HTS is also a relatively tedious surgical procedure, involving the evaluation and design of the recipient site, selection of the donor area, the calculation of hair follicle (HF) number, separation and preservation of HFs, and the process of HF implantation. Each of these steps is closely related to the visual postoperative effects. Based on our experience, the aesthetic result of HTS mainly relies on some indicators, including selection of the donor site, direction and angle of grafted hairs, density, and survival rate of implanted HFs. (1) Selection of the donor site: body hairs are not usually a donor area. For HTS, beard, pubic hair, and chest HTS, regardless of the texture of hair, the occiput is usually chosen as a donor. For eyelash and eyebrow implantation, we usually select hairs with a texture that approximates the eyelashes or eyebrows, such as hairline hair of the periauricular area or nape. For patients with curly hair, we do not transplant eyelashes or eyebrows. (2) Direction and angle of grafting hair: the surgeon is the main factor influencing the growth direction of implanted hair. To achieve a natural appearance, HFs should be implanted according to the natural direction of hair

growth. For scalp hair, over the frontal to mid-scalp area, the hairs are in an anterior or forward direction with acute angulation. Over the temples and parietal area, the direction is more inferoposterior with very acute angles, especially over the temple points and sideburn areas, which have angles almost flat to the skin. The vertex area can be a complicated area to transplant because hairs may follow a whorl pattern. For eyebrows, the shape of the eyebrow appears like a sword with a linear base. The upper part of the eyebrow is bowed with a pointed tail. The medial and distal ends are essentially in the same horizontal line, except in younger individuals, in whom the lateral end is slightly higher. Insertion of the grafts is crucial. When the needle is inserted, the direction in the superior edge of the medial one-third will be directed down below to the brow axis instead of upward, as in the normal anatomy. In addition, the needle is inserted in an acute angle to almost flat to the skin. (3) Density of implanted hair: for East Asians, the density of scalp hair is approximately 75 follicles/cm².⁶ For scalp, to achieve a normal appearance, 35 to 40 grafts/cm² are usually implanted for the hairline and frontal region, and 50 to 60 grafts/cm² are usually grafted for the parietal region. Other areas, however, such as the eyebrows and eyelashes, are usually required to achieve normal density. Factors affecting the density of HTS also include the patient and surgeon. For the patient, HTS can achieve normal hair density using an appropriate slitting technique, except for the recipient site with atrophic scars and subcutaneous soft tissue loss. For the surgeon, on the premise of ensuring the survival of implanted hair, using different punch tools is the key. In terms of the size of the slits, generally, grafts with 1 hair

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FIGURE 1. A 26-year-old man with a relative higher apex, which was treated with 450 grafts (left) and 420 grafts (right). (above left and right) Preoperative view. (below left and right) Close-up view 12 months after the operation (the patient consent to use the figures).



FIGURE 2. A 28-year-old man had left eyebrow loss after a traffic accident, which was treated with 230 one-hair grafts. (above left and right) Preoperative view. (below left and right) Close-up view 15 months after the operation (the patient consent to use the figures).

correspond to slits created by a 20- to 21-gauge hypodermic needle or 0.7 to 0.9 mm mini blades, and 2- to 3-hair grafts correspond to slits created by 18- to 19-gauge needles or 1.0 to 1.1 mm mini blades. Based on our experience, using the slitting needle with 1 mm or 0.8 mm diameter can usually achieve a better density. (4) Survival rate of implanted hair: The survival rate of HFs is mainly influenced both by patients and surgeons. For the patient, in addition to atrophic scars, other local factors usually do not affect the survival of transplanted hair. For the surgeon, if the surgeon has more than 3 years of experience in HTS and the harvested HFs can be stored at 4°C or 0°C Ringer solution in vitro, the survival rate of HFs is usually up to 90%.

According to our experience, good results can be achieved as long as you comply with the above requirements (Figs. 1 and 2).

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